

**BIOGRAPHICAL SKETCH**

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NAME	POSITION TITLE
<b>Michael J. Wolkowicz, Ph.D.</b>	<b>Instructor of Research</b>

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
American International College	B.A.	1976	Biology
University of Montana, MT	B.S.	1980	Microbiology
University of Montana, MT	M.S.	1983	Biochemistry
University of Southern California, Los Angeles, CA	Ph.D.	1992	Biochemistry
University of Southern California, Los Angeles, CA	Postdoc	1992-1993	Biochemistry

**RESEARCH AND PROFESSIONAL EXPERIENCE:**

1. Specialist in Microbiology Core Facility, Department of Biology, American International College, Springfield, MA, 1975-76, Dr. Murnane-Supervisor.
2. Teaching Assistant, Department of Biology, American International College, Springfield, MA, 1976-76, Dr. Cohen-Chairman.
3. Autopsy Assistant, Wesson Memorial Hospital, Springfield, MA, 1975-76, Dr. Otto-Department Head.
4. Laboratory Specialist for Limnological Center, Department of Chemistry, University of Montana, Missoula, MT, 1979, Dr. Juday-Laboratory Head.
5. Teaching Assistant, Department of Chemistry, University of Montana, Missoula, MT, 1980-81, Dr. Hill-Division Leader.
6. Research Assistant, Department of Chemistry, University of Montana, Missoula, MT, 1981-83, Dr. Watson-Thesis Advisor: Effect of Alkaline Phosphatase on the Reverse Transcriptase of Avian Myeloblastosis Virus During Reconstructed Reverse Transcription.
7. Research Associate, Division of Molecular Biology, AMGEN, Thousand Oaks, CA, 1983-87, Dr. C.F. Morris-Supervisor, Bacterial Vector Department.
8. Research Associate, NIH Predoctoral Fellowship, Department of Biochemistry, University of Southern California, Los Angeles, CA, 1987-92, Dr. P.A. Jones-Thesis Advisor: Analysis of Mesodermal Determination Genes in Culture.
9. NIH Postdoctoral Fellowship, Department of Biochemistry, University of Southern California, Los Angeles, CA, 1992-93, Dr. L. Kedes-Chairman.
10. HHS Postdoctoral Research Associate, Department of Cell Biology, University of Virginia, Charlottesville, VA, Dr. J. Herr-Director, Center for Recombinant Gamete Contraceptive Research.
11. Director of Diagnostic Development, ContraVac (a start-up company being developed at the University of Virginia).
12. Director of Molecular Engineering, Responsible for daily operations of a Proteomics/Reproductive Biology laboratory dedicated to vaccine and diagnostic product discovery and development.
13. Instructor of Research in Cell Biology, Department of Cell Biology and Center of Research in Contraception and Reproductive Health, University of Virginia, Charlottesville, VA. March, 2003 to Present.

**Honors:**

Membership in Phi Sigma Phi Science Honors Society, 1975; Membership in Outstanding Young Men of America, 1976; Coauthor Proprietary AMGEN Patent Disclosure #183; Awarded Public Health Service Predoctoral Fellowship for Cancer Research (#5-T32-CA-09320-11), 1987-88; Deuel Award for Outstanding Biochemistry Graduate Student by Biochemistry Faculty at U.S.C., 1993; Awarded Postdoctoral Fellowship for Cancer Research (#1-R32-CA-49758-1), 1992-93; Awarded NIDDK Postdoctoral Fellowship for Cell and Molecular Biology Research of the Urogenital System, 1993-94.

**Publications:**

1. P.A. Jones, M.J. Wolkowicz, M. Harrington and F.Gonzales. Methylation and expression of the MyoD1

determination gene. *Philosophical Transactions of the Royal Society of London B* 326: 277-284 (1990).

2. P.A. Jones, **M.J. Wolkowicz**, W.M. Rideout, F. Gonzales, C.M. Marziasz, G.A. Coetzee and S.J. Tapscott. De Novo methylation of the MyoD1 CpG island during the establishment of immortal cell lines. *Proceedings of the National Academy of Sciences USA* 87: 6117-6121 (1990).
  3. **M.J. Wolkowicz**, S.A. Coonrod, P.P. Reddi, J.L. Millan, M-C. Hofmann and J.C. Herr. Refinement of the differentiated phenotype of the spermatogenic cell line GC-2spd(ts). *Biology of Reproduction* 55: 923-932 (1996).
  4. A. Mandal, S. Naaby-Hansen, **M.J. Wolkowicz**, K. Klotz, J. Shetty, S. Coonrod, M. Kinter, N. Sherman, F. Cesar, C.J. Flickinger and J.C. Herr. FSP95, a testis-specific, auto- and iso-antigenic 95kDa fibrous sheath protein undergoing tyrosine phosphorylation during human sperm capacitation. *Biology of Reproduction* 61:1184-1197 (1999).
  5. S. Naaby-Hansen, **M.J. Wolkowicz**, K. Klotz, L.A. Bush, V.A. Westbrook, H. Shibahara, J. Shetty, S. Coonrod, P.P. Reddi, J. Shannon, M. Kinter, N.E. Sherman, J. Fox, C.J. Flickinger and J.C. Herr. Co-localization of the inositol 1,4,5-triphosphate receptor and calreticulin in the equatorial segment and in membrane bounded vesicles in the cytoplasmic droplet of human spermatozoa. *Human Reproduction* 7(10):923-933 (2001).
  6. **M.J. Wolkowicz**, S. Naaby-Hansen, A.R. Gamble, P.P. Reddi, C.J. Flickinger, and J.C. Herr. Tektin B1 Demonstrates Flagellar Localization in Human Sperm. *Biology of Reproduction*, 66:241-250 (2002).
  7. S. Naaby-Hansen, A. Mandal, **M.J. Wolkowicz**, B. Sen, V.A. Westbrook, J. Shetty, S.A. Coonrod, K. Klotz, L.A. Bush, C.J. Flickinger, and J.C. Herr. CABYR, a novel calcium-binding tyrosine phosphorylation regulated fibrous sheath protein involved in capacitation. *Developmental Biology* 242:236-254 (2002).
  8. Z. Hao, **M.J. Wolkowicz**, J. Shetty, K. Klotz, L. Bolling, B. Sen,, V.A. Westbrook, S. Coonrod, C.J. Flickinger and J.C. Herr. SAMP32, a testis-specific, isoantigenic sperm acrosomal membrane-associated protein. *Biology of Reproduction* 66:735-744 (2002).
  9. L.A. Bush, J.C. Herr, **M.J. Wolkowicz**, N.E. Sherman, A. Shore, and C.J. Flickinger. A novel asparaginase-like protein is a sperm autoantigen in rats. *Molecular Reproduction and Development*. 62: 233-247 (2002).
  10. J. Rao, J.C.Herr, P.P. Reddi, **M.J. Wolkowicz**, L.A. Bush, N.E. Sherman, M. Black and C.J. Flickinger. Cloning and characterization of a novel sperm associated isoantigen (E-3) with defensin and lectin-like motifs expressed in rat epididymis. *Biology of Reproduction Biol. Reprod.* 68:290-301 (2003).
  11. B. Sen, A. Mandal, **M.J. Wolkowicz**, Y-H. Kim, P. Reddi, J. Shetty, L.A. Bush, C.J. Flickinger and J.C. Herr. Splicing in murine CABYR and its genomic structure. *Gene* 310:67-78 (2003).
  12. Shetty J, **Wolkowicz MJ**, Digilio LC, Klotz KL, Jayes FL, Diekman AB, Westbrook VA, Farris EM, Hao Z, Coonrod SA, Flickinger CJ, Herr JC. SAMP14, a novel, acrosomal membrane-associated, glycosylphosphatidylinositol-anchored member of the Ly-6/urokinase-type plasminogen activator receptor superfamily with a role in sperm-egg interaction. *J. Biological Chemistry* 278:30506-30515 (2003).
  13. **M.J. Wolkowicz**, J. Shetty, A. Westbrook, K. Klotz, F. Jayes, A. Mandal, C.J. Flickinger and J.C. Herr. Equatorial Segment Protein Defines a Discrete Acrosomal Subcompartment Persisting Throughout Acrosomal Biogenesis. *Biology of Reproduction* 69, 735-745 (2003).
  14. **M.J. Wolkowicz**, J. Shetty, L. Bolling, S. Coonrod, K. Klotz, C.J. Flickinger and J.C. Herr. Equatorial Segment Protein (ESP) is a human auto- and alloantigen involved in sperm-egg binding and fusion. Submitted to *Molecular Human Reproduction*.
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15. B.E.Kurth, L.Digilio, P.Snow, L.A.Bush, **M.J.Wolkowicz**, J.Shetty, A.Mandal, Z.Hao, P.P.Reddi, C.J.Flickinger and J.C.Herr. Immunogenicity of a multi-component recombinant anti-sperm vaccine in *Macaca fascicularis*. Submitted to Vaccine.

#### **Abstracts:**

1. **M.J. Wolkowicz** and Kenneth F. Watson. Effect of Alkaline Phosphatase on the Reverse Transcriptase of Avian Myeloblastosis Virus During Reconstructed Transcription. 43rd Annual Montana Academy of Sciences Meeting, Bozeman, MT, April, 1983. Proceedings of Montana Academy of Sciences 43:16 (1983). Invited Podium Talk.
  2. **M.J. Wolkowicz** and Peter A. Jones. Isolation by Subtractive Hybridization of Genes Expressed in a Bipotential Cell Line. Poster at 83rd Annual A.A.C.R Meeting, San Diego, CA, May, 1992. Proceedings of American Association for Cancer Research 33: 358 (1992).
  3. **M.J. Wolkowicz** and John C. Herr. Tissue-Specific Gene Expression During Acrosomal Biogenesis. 14th Annual A.S.R.I. Meeting, Philadelphia, PA, June, 1994. American Journal of Reproductive Immunology 31(4): 225 (1994). Invited Podium Talk.
  4. **M.J. Wolkowicz**, P.P. Reddi, A.J. Freemerman, C.J. Flickinger and J.C. Herr. SP-10: A Model Testis-Specific Antigen. Podium Talk at 16th International Congress of Biochemistry and Molecular Biology, New Delhi, India, September, 1994. Proc. of I.C.B.M.B. 16(III): 37 (1994). Invited Podium Talk.
  5. **M.J. Wolkowicz** and J.C. Herr. Analysis of the GC-2spd(ts) cell line for expression of cell-type specific markers of differentiation. 35th Meeting of A.S.C.B., Washington, DC, December, 1995. Molecular Biology of the Cell (Supplement) 6: 315a (1995).
  6. Herr, J.C., Naaby-Hansen, S., Diekman, A.B., **Wolkowicz**, **M.J.**, Westbrook-Case, A., Norton, E., Klotz, K., Shibahara, H., Koul, D., Mandal, A., Shetty, J. and Flickinger, C.J. Discovery and Characterization of Sperm Contraceptive Vaccinogens. CSIRO, Australia (1997).
  7. Naaby-Hansen, S., **Wolkowicz**, **M.J.**, Shibahara, H., Shetty, J., C.J. Flickinger and J.C. Herr. Towards a comprehensive 2-D gel protein database for the human spermatozoon. 30th Annual Meeting of the Society for the Study of Reproduction. Portland, Oregon. Biology of Reproduction, 56 (Supplement 1):172 (Abs. 358) (1997).
  8. Naaby-Hansen, S., **Wolkowicz**, **M.J.**, Shannon, J., Kinter, M., Reddy, P.P., Shibahara, H., Bush, L.A., Fox, J. and Herr, J.C. Human spermatozoa calreticulin: From 2-D gel spot to isolation of testicular cDNA. 13<sup>th</sup> Ann. Meeting ESHRE, Edinburgh (1997).
  9. Herr, J.C., Naaby-Hansen, S., **Wolkowicz**, **M.J.**, Mandal, A., Jagatpalla, S. and Flickinger, C.J. A strategy for identification and cloning of novel sperm surface immunogens. Ann. Meeting of Federation of American Society Experimental Biology. FASEB Journal 12 (Part 2, Supplement S):5276 (1998).
  10. **Wolkowicz**, **M.J.**, Nabby-Hansen, S. and Herr, J.C. Cloning, Sequencing, Expression and Analysis of a Human Testicular Tektin B1-like Protein. 31<sup>st</sup> Ann. Meeting Society for the Study of Reproduction. Biology of Reproduction 58 (Supplement 1):175 (Abs. 331) (1998).
  11. Mandal, A., Naaby-Hansen, S., Klotz, K., **Wolkowicz**, **M.J.**, Shetty, J., Cesar, F., Flickinger, C.J. and Herr, J.C. Two novel human sperm fibrous sheath proteins which undergo phosphorylation during capacitation. American Society of Cell Biology. Molecular Biology of the Cell (Supplement S) 9:381 (1998).
  12. Hao, Z., **Wolkowicz**, **M.J.**, Shetty, J., Flickinger, C.J. and Herr, J.C. Cloning and characterization of putative human sperm membrane antigen related to circumsporozoite (SMARC32). 33<sup>rd</sup> Ann. Meeting Society for the Study of Reproduction. Biology of Reproduction 62 (Supplement 1):154 (Abs.122) (2000).
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13. Mandal, A., Klotz, K., **Wolkowicz, M.J.**, Shetty, J., Jayes, F.L., Flickinger, C.J., and Herr, J.C. APL17 and APLX: Two novel human acrosomal pseudo-lysozymes. American Society of Cell Biology. Molecular Biology of the Cell (Supplement S) 11:2694 (2000).
14. Naaby-Hansen, S., Mandal, A., **Wolkowicz, M.J.**, Buer, S., Retief, J., Westbrook, A., Shetty, J., Cox, M., Jayes, F.L., Coonrod, S.A., Klotz, K., Shows, T.B., Eddy, R.L., Bush, L.A., Flickinger, C.J., and J.Herr, J.C. CBP86, A novel testis-specific Ca<sup>2+</sup>-binding protein localized in the human sperm tail is regulated by phosphorylation during in vitro capacitation. American Society of Cell Biology. Molecular Biology of the Cell (Supplement S) 11:2696 (2000).
15. **Wolkowicz, M.J.**, Shetty, J., Jayes, F.L., Flickinger, C.J. and Herr, J.C. An autoantigenic osteoglycin-like sperm protein discovered by 2D proteomics. 2<sup>nd</sup> Intl. Conf. on Exptl. and Clinical Reprod. Biol., Amsterdam 2000. J. Reprod. Immunology 51:56 (2001).
16. Hao, Z.L., **Wolkowicz, M.J.**, Shetty, J., Klotz, K., Coonrod, S.A., Bolling, L., Sen, B., Westbrook, V.A., Flickinger, C.J. and Herr, J.C. SAMP32, a novel, testis-specific, membrane-associated protein, is localized to the acrosome of human spermatozoa. 34<sup>th</sup> Ann. Meeting Society for the Study of Reproduction. Biology of Reproduction 64 (Supplement 1): (Abs.194) (2001).
17. Naaby-Hansen, S., Mandal, A., **Wolkowicz, M.J.**, Buer, S., Retief, J., Westbrook, A., Shetty, J., Cox, M., Jayes, F.L., Coonrod, S.A., Klotz, K., R.L., Bush, L.A., Flickinger, C.J., and Herr, J.C. Alternative splicing of CBP86, a novel testis-specific Ca<sup>2+</sup>-binding protein localized in the tail of human sperm. 2<sup>nd</sup> Intl. Conf. on Exptl. and Clinical Reprod. Biol., Amsterdam 2000. J. Reprod. Immunology 51:57 (2001).
18. Shetty, J., **Wolkowicz, M.J.**, Diekman, A., Jayes, F.L., Flickinger, C.J. and Herr, J.C. Cloning and characterization of C58, a novel, hydrophobic, putative human sperm membrane antigen related to the LY-6 family of proteins. 2<sup>nd</sup> Intl. Conf. on Exptl. and Clinical Reprod. Biol., Amsterdam 2000. J. Reprod. Immunology 51:57 (2001). Invited Podium Talk.
19. Herr, J.C., Flickinger, C.J., **Wolkowicz, M.J.**, Naaby-Hansen, S., Hao, Z., Mandal, A., Shetty, J., and Jayes, F.L. Sperm-specific Auto- and Iso-antigens Identified by 2-D Gel-based Proteomics. 8<sup>th</sup> Intl. Congress on Rep. Imm. Croatia (2001).
20. Rao, J., Herr, J.C., Reddi, P., **Wolkowicz, M.J.**, Bush, L.A., Sherman, N.E. and Flickinger, C.J. Identification and cloning of E-3: A novel sperm-coating isoantigen with defensin/lectin-like motifs in rat epididymal fluid. 3<sup>rd</sup> Intl. Conf. on the Epididymis. Poster P-19, Charlottesville, VA (2002).
21. J.C. Herr, C.J. Flickinger, J. Shetty, A. Westbrook, L. Bolling, K. Klotz, S. Coorod, F. Jayes, A. Mandal and **M.J. Wolkowicz**. Definition of the equatorial segment as a discrete subcompartment in the nascent acrosomal vesicle that persists throughout human acrosomal biogenesis. North Amer. Testis Workshop: Functional genomics of male reproduction. Phoenix, AZ. (March, 2003).
22. **M.J. Wolkowicz**, J. Shetty, A. Westbrook, K. Klotz and J.C. Herr. Equatorial Segment Protein (ESP): An alloantigenic glycoprotein provides evidence for an equatorial segment subcompartment in acrosomal vesicle stage spermatids. Amer. Asso. Anat., Experimental Biology Meeting. San Diego, CA. Abs. #3819. (April 2003).
23. J.C. Herr, **M.J. Wolkowicz**, J. Shetty, A. Mandal, Z. Hao, L. Digilio, and B.E. Kurth. Immunogenicity of a pentavalent recombinant subunit anti-acrosomal vaccine in monkeys. Hippokration Congress on Reproductive Immunology. Rhodes, Greece. (June, 2003).
24. Kim, Y-H., Sen, B., Vanage, G., Mandal, A., **Wolkowicz, M.J.**, Pulido, S., Klotz, K., Hao, Z., Flickinger, C.J. and Herr, J.C. Polymorphic CABYR coding region A (CR-A) and coding region B (CR-B) are expressed in mouse sperm and localize to the Fibrous Sheath. 37<sup>th</sup> Ann. Meeting Society for the Study of Reproduction. Biology of Reproduction (Supplement 1): (Abs. 695) Vancouver, Canada (August, 2004).
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**Patents:**

- 1.) Inventors: Herr, J.C., Flickinger, C.J., Wolkowicz, M.J. and Naaby-Hansen, S.: "Methods for the Production of Vaccines against Cell Surface Antigens." US Patent Application 08/805,147, Filed February 25, 1997.
  - 2.) Inventors: Herr, J.C., Wolkowicz, M.J. and Mandal, A.: "FSP95, a Testis-specific Auto- and Iso-antigenic 95 kDa Fibrous Sheath Protein Undergoes Tyrosine Phosphorylation During Human Sperm Capacitation." Filed February 8, 1999.
  - 3.) Foreign Patents have been filed under the Patent Cooperation Treaty for the above Patent in 15 additional countries in the European Patent Office.
  - 4.) Inventors: Herr, J.C., Mandal, A., Wolkowicz, M.J., Shetty, J. and Jayes, F. "Lysozyme Proteins Associated with Human Sperm." Filed January 19, 2000.
  - 5.) Foreign Patents have been filed under the Patent Cooperation Treaty for the above Patent in 15 additional countries in the European Patent Office.
  - 6.) Inventors: Herr, J.C., Naaby-Hansen, S., Wolkowicz, M.J., Mandal, A. and Buer, S.: "Sperm-specific Protein CBP86." Filed January 19, 2000.
  - 7.) Foreign Patents have been filed under the Patent Cooperation Treaty for the above Patent in 15 additional countries in the European Patent Office.
  - 8.) Inventors: Gilmer, L., Mandal, A., Wolkowicz, M.J., Klotz, K. and Herr, J.C. "Sperm-Paint: Identifying Sperm for Forensic Applications". Filed February 6, 2004.
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